X. *On New or imperfectly known Species of Marine* Ostracoda.

By George Stewardson Brady.

Read March 14, 1865.

[Plates LVII.–LXII.]

Of the sixty-seven species described in the following paper, ten have been identified with forms already described and figured from fossil (chiefly Tertiary) specimens; *two* species, *Bairdia subdeltoidea*, Münster, and *Cythere setosa*, Baird, were already known in the recent state, but appeared to require further illustration. The remaining *fifty-five* species I have been unable to refer to any published forms[1], though many of them have, as might be expected, very near relatives amongst the Tertiary fossils. The ten fossil species of which descriptions are now given for the first time, from recent specimens, are as follows:—*Cytherella beyrichi*, Reuss; *Bairdia ovata*, Bosquet; *Cytherideis gracilis*, Reuss; *Cytheridea mülleri*, Münster; *Cythere jurinei*, Münster; *C. canaliculata*, Reuss; *C. plicatula*, Reuss; *C. clathrata*, Reuss; *C. subcoronata*, Speyer; *C. scabra*, Münster.

The difficulty of identifying Ostracoda merely by reference to figures and descriptions is much increased by our uncertainty as to the characters which can rightly be considered as indices of specific rank. A vast number of species have been founded on peculiarities of surface-marking; but it is quite certain that this, unless accompanied by other distinctions, is in most cases a character upon which no reliance whatever can be placed. The range of variation, in this respect, which may be observed in the same species as the result of age or peculiarity of habitat, is very great, and may be appreciated by reference to the figures (Pl. LIX. fig. 14, *a–g*) of *Cythere mutabilis*, Brady, M.S. There is, indeed, scarcely any species which does not exhibit very great variety of surface-marking: nevertheless, so far as my observation extends, the variation is always in the same direction for the same species; that is to say, a species—*Bairdia subdeltoidea*, for instance—may run through many shades of sculpturing, from a perfectly smooth to a strongly punctate carapace, but the intermediate forms will be characterized merely by greater or less development of the typical form of sculpture. There will never be any tendency to a rugose, striated, tubercular, or any other system of ornamentation. If such a deviation were observed, it would lead one to suspect a specific difference[2].

[1] Since this was written, three of the species here described, *Jonesia simplex*, *Cythere latissima*, and *Cytheridea papillosa* have been figured and described from British specimens by the Rev. A. M. Norman.

[2] Yet, even in this respect, it is necessary to speak with some reservation; for we find it an almost uniform

And if little dependence can be placed on surface-markings, neither can we any more rely upon the spinous armature which is often observed at the extremities or round the margins of the valves. These also vary much with age, and in the same gathering may often be found either entirely absent or very well developed. Even the hinge-articulation, which has been taken as a principal generic distinction, is liable to vary in degree of development, not only in the same genus, but in different examples of the same species; so that, even in mature individuals it is often difficult to say to what genus the species ought to be referred. This may very sufficiently account for the various positions to which some species are assigned by different authors.

The lucid spots afford, in some cases, excellent generic and possibly even specific characters. Good illustrations of this are afforded by the genus *Cytherella*, by *Jonesia simplex*, *Bairdia fusca*, *Cytheridea kirkbii*, &c. But the features on which most reliance is to be placed are the general form and proportions of the carapace in its lateral and dorsal aspects and the character (not the quantity) of surface-ornament. The probability of a small and slightly marked specimen being the young of some species is always to be kept in view. Examples of young forms, which I at one time supposed to be distinct species, are figured at Pl. LIX. figs. 9 & 10 (*Cythere clathrata*, var. *nuda*), ib. fig. 14 *a*, *b* (*Cythere mutabilis*, Brady), and Pl. LVIII. fig. 12 (*Cythere setosa*).

For two groups which possess well-marked distinctive characters I have here proposed the generic names *Jonesia* and *Normania*. The only other new genus which I have found it necessary to establish is *Heterodesmus*—a highly curious and interesting natatory form, allied to the fossil Carboniferous species *Entomoconchus scouleri*, M'Coy. For this, as well as for the species of *Cypridina* now described, I am indebted to Arthur Adams, Esq., R.N., by whom they were taken in the towing-net in the Japanese and Chinese seas. My thanks are due also to Professor T. Rupert Jones and Messrs. W. K. Parker, E. C. Davison, and W. M. Wake, who have kindly furnished me with most of the specimens from which the following descriptions have been drawn up.

It is with considerable hesitation that I have felt myself compelled to adopt the genus (or subgenus) *Cythereis*. The species—our British *C. jonesii*, for instance—which may be looked upon as typical of that group, are so well marked and so peculiar in

rule that a pitted sculpture on the lateral aspect of the valves is converted into furrows, more or less distinct, on the ventral surface. In some species this is very well marked (*Cythere septentrionalis*, &c.), and appears to be produced by a coalescence of the pits. Occasionally the process of formation of longitudinal furrows may be observed in an intermediate stage (*Cythere hodgii*). And, seeing that in some species there exist small elevated tubercles on the spaces between the pittings, it is quite conceivable that, by the filling up of the excavations, the shell might come to exhibit only small tubercles or papillæ on a smooth surface. But I have seen no examples in which this alteration can be traced; and, if it were so, a species which had assumed a constant character of its own by this means must have attained it by a long course of natural modification, and would, I conceive, be entitled to rank as a distinct species. I have, however, observed that some species, which in young and early adult life present a smooth surface studded with papillæ, become in old age encrusted with a calcareous coat which exhibits pits or depressions in place of the papillæ.

their characters that it would be very satisfactory to be able without misgiving to place them in a distinct genus. But the characters which have been proposed for the genus *Cythereis* slide so insensibly, and through so many osculant forms, into *Cythere*, that I have found it almost impossible, in many cases, to determine to which genus a particular species ought to be referred. *Cythere septentrionalis*, *C. costata*, *C. cristatella*, &c., may be taken as examples of these debateable forms. Under these circumstances, there seemed to be but two reasonable courses open to me—either to reject the genus altogether, or to restrict it by some arbitrary line to the conspicuously fimbriated, spinous, and quadrilateral species so well represented by *C. jonesii*. I have chosen the latter course as being, on the whole, of the greater practical utility. A more perfect knowledge of the various species, and especially of the anatomy of the animals, will probably in time lead to a better classification.

Order OSTRACODA, *Latreille*.

Family CYPRIDÆ, *Baird*.

Subfamily Cytherinæ, *Dana*.

Genus Cytherella, *Jones* (subgenus).

Generic Characters.—"*Animal* unknown. *Carapace* oblong, compressed; smooth or pitted; no terminal denticulations: contact-margins of the right (larger) valve grooved or rabbeted on its inner edge for the reception of a flange presented by the contact-margin of the left (smaller) valve; both groove and flange stronger at the posterior than at the anterior portion of the valves." *Lucid spots* arranged in a curved pinnate series on an oblong, obliquely placed depression near the centre of the shell. The depression appears internally as an elevation or tubercle. The number of the spots is from twelve to sixteen, and in shape they are linear-oblong, increasing in length towards the ventral margin.

1. Cytherella pulchra, n. sp. (Pl. LVII. fig. 1, *a–d*.)

Carapace elliptic-oblong. *Dorsal* and *ventral* margins nearly straight, parallel, slightly sinuated. *Extremities* rounded. Dorsal aspect ovate-oblong, compressed. *Surface* smooth, white. *Lucid spots* near the middle of the ventral half of the carapace, consisting of about sixteen linear-ovate spots arranged in a pinnate manner along a central curved line, the larger spots being nearest to the ventral margin; the whole group is situated in a slight depression of the valves, and is very conspicuous also on the inner surface.

Length $\frac{1}{42}$ in. (·6 mm.).

Hab. Australia.

2. Cytherella punctata, n. sp. (Pl. LVII. fig. 2, *a*, *b*.)

Oblong-oval, convex, narrowed anteriorly. The *dorsal margin* is straight, the *ventral* irregularly sulcate on its anterior half; its posterior half sloping steeply backwards. *Dorsal aspect* compressed, ovate or subcuneate. *Surface* thickly set with round punctations, irregularly puckered towards the ventral border. *Lucid spots* similar to those of the preceding species.

Length $\frac{1}{45}$ in. (·57 mm.).

Hab. Levant (sponge-sand).

3. Cytherella beyrichi, *Reuss*. (Pl. LVII. fig. 3, *a*, *b*.)

Cytherina beyrichi, Reuss, Zeitsch. Deutsch. Geol. Ges. iii. p. 89, t. 7. fig. 65.

Cytherella beyrichi, Bornemann, Zeitsch. Deutsch. Geol. Ges. vii. p. 354, t. 20. fig. 1. Speyer, Ostracoden der Casseler-Tertiärbildung, p. 54, t. 1. fig. I, *a–c*.

Cytherella compressa, var. 1, Jones, Entom. of Tert. Form. of England, p. 55, pl. 5. fig. 18.

Valves compressed, oblong oval. *Extremities* rounded, posterior rather the broadest. *Ventral* and *dorsal margins* gently sinuated in the middle. *Surface* smooth, closely punctate. Seen from below, the carapace is compressed, oblong, quadrilateral, narrowed in front, and truncate at each extremity.

Length $\frac{1}{32}$ in. (·8 mm.).

Hab. Norway (*Messrs. M'Andrew and Barrett's dredgings*).

4. Cytherella rugosa, n. sp. (Pl. LVII. fig. 4, *a*, *b*.)

Carapace quadrilateral, surrounded by a flattened border. *Dorsal* and *ventral margins* parallel; ventral sinuated, dorsal nearly straight. *Extremities* rounded; the posterior rather flattened, with rounded angles. Seen from below, the carapace is compressed, cuneate. *Surface* of valves minutely and closely pitted, raised into irregular flexuous elevations. *Lucid spots* similar to those of *C. pulchra*.

Length $\frac{1}{45}$ in. (·57 mm.).

Hab. Australia.

Genus Jonesia, nov. gen.

Limbs long and slender. *Antennæ* exceedingly small, slender, and destitute of spines. *Carapace* elongated, compressed, rounded in front, narrowed or acutely pointed behind. *Shell* thin and fragile, mostly without sculpture of any kind. *Hinge-margins* perfectly simple; consisting of two thin opposing edges held together by a ligamentous tissue: straight, or slightly sinuous towards each extremity. *Lucid spots* linear-oblong in shape, arranged in a parallel series, those in the middle being the longest; the whole group forming an obliquely-transverse oval patch near the centre of the valve.

1. Jonesia simplex, *Norman*. (Pl. LVII. fig. 11, *a–e*.)

Cythere simplex, Norman, Nat. Hist. Trans. Northumberland and Durham, vol. i. p. 17, pl. 5. figs. 1–4.

Carapace compressed, elongated, rounded and narrowed in front, acuminate behind. *Dorsal margin* straight; *ventral margin* bulging considerably behind; the two margins are parallel for the greater part of their length, but converge suddenly and equally behind, forming an acuminate extremity. Anterior *extremity* narrowed, somewhat obliquely rounded. Viewed from above, the carapace is compressed, oblong oval, tapering at each extremity, subacute in front, pointed behind. *End view* broadly ovate. *Lucid spots* about six in number; each spot linear-oblong and slightly curved, arranged in a parallel series, those in the middle being the longest, thus forming an oval patch placed in an oblique direction across the central portion of the shell. *Surface* smooth.

Length $\frac{1}{20}$ in. (1·27 mm.).

Hab. Hunde Islands (*Dr. P. C. Sutherland's dredgings*). Shetland, Dogger Bank, and Holy Island (Northumberland). Isle of Bute (*Mr. D. Robertson*).

This species was very recently (1865) described by Mr. Norman from specimens taken on the Dogger Bank. The perfectly simple character of the hinge-joint does not allow of its being classed under any of the established genera; and as it, in common with some other species, possesses further distinctive characters, I here propose for their reception the genus *Jonesia*, named after Professor T. Rupert Jones, whose valuable labours amongst the fossil Entomostraca need no further comment. In addition to the present species, *Cythere contorta*, Norman, and *C. variabilis*, Baird, may be noted as coming under the genus *Jonesia*.

J. simplex is an exceedingly well marked species, and apparently very constant in its characters, there being little or no difference observable between the specimens from the various localities mentioned above. I have also seen fossil specimens collected by Mr. D. Robertson from the glacial clay of the Clyde district, which are in no respect distinguishable from the recent ones. The species figured by M. Bosquet (Crustacés Fossiles de Limbourg) as *Cytheridea harrisiana*, Jones, is either identical with, or very nearly allied to, the present species. The true *Bairdia harrisiana*, of which Mr. Jones has kindly allowed me to examine the type specimens, is an entirely different thing.

Genus Bairdia, *M'Coy*.

Animal a *Cythere* (?). *Carapace* varying from a broadly triangular form with rounded or obtuse extremities, to a narrow, elongate, subtriangular form with somewhat acute extremities. *Surface* quite smooth, finely punctate, or occasionally setiferous; no central tubercle. *Lucid spots* mostly well marked. The right valve is much the smaller of the two, and its edge lies within, and on the dorsal margin is overlapped by, that of the left. The dorsal edge of the right valve is quite simple. Ventral margin incurved.

1. Bairdia bosquetiana, n. sp. (Pl. LVII. fig. 5, *a–e.*)

Carapace reniform, much compressed. The *dorsal margin* is arched, highest a little in front of the centre; *ventral margin* gently sinuated. *Extremities* rounded, the posterior slightly narrowed. *Surface* smooth, white, with opaque patches, sparingly beset with small papillæ. *Lucid spots* four, rather large and crowded together. *Dorsal outline* compressed, oblong-oval, with pointed extremities.

Length $\frac{1}{40}$ in. (·635 mm.).

Hab. Atlantic Ocean, 470 fathoms (*Commander Dayman's soundings*).

In its lateral aspect this species is strikingly similar to *Cytheridea papillosa*. The lucid spots are, however, differently arranged, and the structure of the hinge-joint distinctly shows it to belong to the genus *Bairdia*.

2. Bairdia amygdaloides, n. sp. (Pl. LVII. fig. 6, *a–c*).

Carapace broadly ovate, convex, tapering to a point posteriorly, rounded in front. *Dorsal margin* boldly arched, *ventral* slightly convex. Seen from below, the outline of the carapace is oval, rather narrowed posteriorly. *Surface* smooth.

Length $\frac{1}{33}$ in. (·78 mm.).

Hab. Australia, 17 fathoms (*Prof. Jukes's soundings*).

I do not feel quite certain that this may not be a variety or the young of *B. fusca* or *B. ovata*.

3. Bairdia ovata, *Bosquet.* (Pl. LVII. fig. 7, *a–c.*)

Cytheridea ovata, Bosquet, Crustacés Fossiles du Limbourg (1853), p. 63, pl. 5. fig. 6, *a–d.*

Carapace ovate. *Dorsal margin* boldly arched; *ventral* nearly straight, with a slight median sinuation. Anterior *extremity* broad, well rounded; posterior narrow, rounded. *Dorsal aspect* ovate. *Surface* white, smooth or slightly hairy.

Length $\frac{1}{26}$ in. (1 mm.).

Hab. Abrolhos Bank.

4. Bairdia fusca, n. sp. (Pl. LVII. fig. 9, *a–d.*)

Carapace subtriangular, about once and a half as long as broad. *Extremities* rounded; the posterior scarcely, or not at all, beaked. The *dorsal margin* is boldly arched, and very high in the middle; the *ventral* is slightly sinuated. Seen from below, the carapace is oval, with pointed extremities. Right valve overlapped by the left, as in *B. subdeltoidea*. The *surface* of the valves is finely punctate, and covered, more especially on the posterior half, with long brown setæ. *Colour* brown. *Lucid spots* well marked (when the valves are denuded), forming a rosette of one central and six encircling spots.

Length $\frac{1}{30}$ in. (·84 mm.).

Hab. Australia.

This appears to be a very distinct species, characterized chiefly by the brown hirsute carapace, rounded form of the valves, and the compressed oval outline as seen from above or below. I have a single valve from Honduras which is probably referable to the same species, but is rather intermediate in form between it and *B. amygdaloides*.

5. Bairdia subdeltoidea, *Von Münster*. (Pl. LVII. fig. 8, *a–h*.)

Cythere subdeltoidea, Von Münster, 1830, Jahrbuch für Mineralogie, p. 64.

Bairdia subdeltoidea, Jones, 1849, Entom. of Cretaceous Formation, &c., p. 23, pl. 5. fig. 15, *a–f*. Bosquet, 1852, Entom. Fossiles des Terrains Tertiaires de la France, p. 29, pl. 1. fig. 13, *a–d*. Jones, 1856, Entom. of Tertiary Formation, p. 52, pl. 4. figs. 2 *a*, 2 *b*, 3; pl. 6. figs. 1 *a*, 1 *b*, 2. Egger, 1858, Ostrakoden der Miocän-Schichten, p. 5, t. 1. fig. 1, *a–c*. Speyer, 1863, Ostracoden der Casseler-Tertiärbildungen, p. 43, t. 1. fig. 5, *a–c* (right valve), and *B. oviformis*, ib. fig. 6, *a–c* (left valve).

Carapace triangular or subtriangular, convex. The *left valve* is larger and much less angular than the right; its ventral margin arched (sometimes flattened); dorsal margin inverted so as to overlap the opposite valve, broad and obliquely rounded in front, more or less produced, tapering, or beaked behind. The *right valve* is narrower, its dorsal border truncate in the middle; the ventral border sinuated and having a well-marked convex protuberance on the anterior third, strongly beaked posteriorly, broad and obliquely convex anterioriy: both extremities are often produced, in old specimens, into flattened, denticulate lamellæ; the dorsal edge is slightly inverted at its anterior and posterior thirds. *Dorsal aspect* oval or subrhomboid. *End view* broadly ovate or suborbicular. *Lucid spots* arranged in a rosette, but seldom so regular as in the preceding species. *Surface* of the valves smooth, often finely punctate, milk-white or pellucid with cloudy patches. The older specimens are mostly quite opaque.

Length $\frac{1}{20}$–$\frac{1}{30}$ in. (1·27–·846 mm.).

Hab. Australia, West Indies, Turk's Island, Crete (360 fathoms, *Capt. Spratt*), Serpho (*Capt. Spratt*).

This species is very widely distributed both in the fossil and recent state; and there are a large number of varieties which appear to be fairly referable to it, being connected by a perfect gradation of intermediate forms. The surface-markings are very much dependent upon age, young specimens being generally pellucid, smooth, and free from hairiness or pittings; adults milk-white in colour, often punctate or slightly pubescent; while old specimens are more rugged in aspect, their punctuation obsolete, and the extremities occasionally developed into dentated laminæ. Besides these various conditions, there are doubtless many varieties resulting from habitat, &c. I do not feel sure that the form described by the Rev. A. M. Norman[1] as *Cythere* (*Bairdia*) *inflata* is properly separable from *B. subdeltoidea*, though its much narrower form renders it, at least, a very distinct variety. Some examples of this form (*B. inflata*), dredged by

[1] Annals and Magazine of Natural History, 3rd series, vol. ix. plate 3. figs. 6, 7, 8.

myself off the Isle of Man, have the posterior extremity remarkably spinous, and are likewise beset with strong brown setæ, in this respect somewhat resembling *B. fusca*.

6. Bairdia crosskeiana, n. sp. (Pl. LVII. fig. 10, *a–d*.)

Triangular, convex, compressed posteriorly. *Left valve* large and overlapping the right; broad, obliquely rounded anteriorly, and tapering to an acute, produced posterior extremity; highest at anterior third. The anterior border is armed with several short, pointed tubercles or spines; the posterior is acutely pointed, and has a squamous lamina, which is continued along the posterior third of the ventral border. *Ventral margin* convex; the *dorsal margin* much elevated at its anterior third, from which it slopes steeply to the posterior extremity. The *right valve* is smaller, its dorsal margin truncated in the middle; anterior extremity broad, obliquely convex, and denticulate; posterior extremity beaked; ventral margin slightly sinuated. Viewed from below, the carapace is hastate in outline, very acute posteriorly, and broadest at its anterior third. *Surface* of the valves smooth, finely punctate. *Lucid spots* as in *B. subdeltoidea*.

Length $\frac{1}{25}$ in. (1 mm.).

Hab. Levant (sponge-sand).

Well characterized by the hastate outline as seen from above, the greatly produced tapering hinder extremity, and the spinous anterior border. There are, however, some forms of *Bairdia subdeltoidea*, from Australia, which closely approach it; and it is a matter of the greatest difficulty to determine the real limits of the various species. My impression is, that the most correct and natural arrangement would be to retain the present *B. subdeltoidea* as the typical form of the species, classing under it, as mere local varieties, *B. amygdaloides*, *B. crosskeiana*, and possibly some of the fossil species described by Continental authors.

Genus Cytherideis, *Jones* (subgenus).

Animal a *Cythere*. *Carapace* oblong-oval, reniform, or subtriangular. "*Hinge-margin* simple, except that, the central portion of the dorsal margin of the left valve being somewhat incurved under that of the right valve, the anterior and posterior angles of the dorsal margin of the left valve remain somewhat projecting, and present internal shallow furrows for the reception of the corresponding angles of the opposite valve: ventral margin partially incurved."

1. Cytherideis decora, n. sp. (Pl. LVII. fig. 13, *a–c*.)

Carapace elongated, triangular, slightly narrowed posteriorly, and highest in the middle. Both *extremities* rounded, the posterior somewhat produced. The *dorsal margin* is arched and rather flattened; *ventral margin* slightly arcuate. Seen from

below, the carapace is oval, compressed. *Surface* smooth, with scattered hairs. *Lucid spots* arranged in an obliquely transverse row near the centre of the carapace.

Length $\frac{1}{25}$ in. (1·05 mm.).

Hab. Australia, 17 fathoms (*Prof. Jukes's soundings*).

Closely related to *Cythere minna*, Baird, but not much more than one-third of the size, and the posterior extremity is not nearly so acute. The greatest height is about the middle, whereas *C. minna* is highest near the front.

2. Cytherideis maculata, n. sp. (Pl. LVII. fig. 12, *a*, *b*.)

Oblong, arcuate, compressed, nearly thrice as long as broad. Anterior extremity tapering to a rounded point; posterior broader, rounded, and produced below the level of the ventral border. *Dorsal margin* arched, highest in the middle. *Ventral margin* gently incurved, with a median convexity. *Surface* smooth, white, marked with a large, oval, pellucid central patch, on which are several (generally three) cloudings of opaque white.

Length $\frac{1}{23}$ in. (1·16 mm.).

Hab. Australia, West Indies, Turk's Island.

3. Cytherideis gracilis, *Reuss*. (Pl. LVIII. fig. 1, *a–d*.)

Cytherina gracilis, Reuss (1850), Haidinger's Abhand. Band iii. p. 52, t. 11. f. 3.
? *Bairdia lithodomoides*, Bosquet, Entom. Fossil. des Ter. Tertiair. p. 36, pl. 2. fig. 3.

Carapace elongate, subarcuate, convex, about twice and a half as long as broad. *Dorsal margin* arched; *ventral* deeply sinuate at anterior third. Anterior border compressed; posterior broad, obliquely rounded. *Dorsal aspect* compressed, ovate. The *shell* is smooth, transparent, mostly of a yellow tint, and, in some specimens, marked on its anterior portion with several concentric undulations or faint ridges, which run nearly parallel with the margins of the valves.

Length $\frac{1}{36}$ in. (·73 mm.).

Hab. Levant (sponge-sand).

Very nearly allied to *Cythere angustata*, Von Münster, but altogether smaller and more fragile, and possibly only a variety of it. I have ascribed my specimens to *C. gracilis* merely from comparison with the figures of that species, having seen no authentic specimens of it; and I am not able to detect any valid distinction between it and *C. angustata*.

In outline this agrees very closely with Reuss's figure, and in surface-marking with Bosquet's; so that it would seem probable that these may properly be regarded as varieties of one and the same species. Yet, in most of my specimens, the concentric rugæ are absent, and in some the sinuation of the ventral margin is scarcely perceptible.

4. Cytherideis (?) oryza, n. sp. (Pl. LVIII. fig. 2, *a*, *b*.)

Valves elongate, convex. *Dorsal margin* arched; *ventral* nearly straight, slightly protuberant posteriorly. *Anterior margin* somewhat obliquely flattened; *posterior* rounded, more pointed than the anterior. *Dorsal aspect* oblong ovate. *Surface smooth*, pellucid, mottled with white or straw-coloured patches.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Hunde Islands (*Dr. Sutherland's dredgings*).

Not unlike in outline to Egger's figure of *Bairdia arcuata*; but distinct from that species as described and figured by M. Bosquet and Professor T. R. Jones.

5. Cytherideis lata, n. sp. (Pl. LVIII. fig. 4, *a*, *b*.)

Carapace reniform, flattened, broadest in front. *Extremities* rounded. *Dorsal margin* arched, highest a little in front of the middle. *Ventral margin* rather deeply sinuated. The *anterior border* forms a flattened lamina, which is continued halfway along the ventral margin. *Surface* smooth or very faintly pitted. *Dorsal aspect* oblong, much compressed.

Length $\frac{1}{33}$ in. (·78 mm.).

Hab. Abrolhos Bank.

6. Cytherideis nobilis, n. sp. (Pl. LVIII. fig. 9, *a–e*.)

Reniform, convex, narrowed in front, nearly twice as long as broad. *Dorsal margin* forming a flattened arch; *ventral* deeply sinuate in the middle. *Anterior margin* narrow, well rounded; *posterior* forming a strongly marked angle at its junction with the ventral border. A narrow, flattened lamina or flange runs along the ventral margin, and is most developed posteriorly. *Dorsal aspect* oval. *Lucid spots* large, mostly six in number; five of them forming an irregular rosette, the sixth slightly apart toward the dorsum. *Surface* smooth, pale brown, mottled with darker spots, and bearing a few distant, short setæ.

Length $\frac{1}{16}$ in. (1·8 mm.).

Hab. Suda Bay, Crete, 40 fathoms (*Capt. Spratt's soundings*). Many specimens.

Young specimens have the two extremities equal, and are destitute of the produced posterior angle. The posterior portion of the valve in mature individuals is marked with a reticulated pattern (which, however, is often obscured by opacity), in this respect, as well as in its angular character, bearing a remarkable resemblance to the freshwater *Candona lucens*.

7. Cytherideis (?) pulchra, n. sp. (Pl. LVIII. fig. 3, *a–c*.)

Ovate, convex, highest in front. *Dorsal margin* arched; *ventral* straight, or very slightly sinuated anteriorly. *Extremities* rounded, the anterior being much the broadest. *Dorsal aspect* ovate, narrowed in front. *Surface* smooth, white, marked with thickly

set rounded pits of irregular size. In the intervals between the hollows, especially near the ventral border, small tubercles are situated. These, however, are few in number compared with the pits.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Hunde Islands, 28–40 fathoms (*Dr. Sutherland's dredgings*). One valve.

The shell-sculpture of this species agrees very much with that of *Cythere kostelensis* as described by Dr. Egger; but in other respects it seems to be perfectly distinct.

8. Cytherideis tigrina, n. sp. (Pl. LVIII. fig. 5, *a–d.*)

Valves oval, convex; extremities rounded, nearly equal. *Anterior margin* forming a wide flattened lamina. *Dorsum* arched. *Ventral margin* slightly convex, sinuate at its anterior third. Seen from above, the carapace is ovate, pointed in front, well rounded behind. *Surface* smooth, white or light grey, marked with bands or patches of brown, and bearing a few scattered papillæ.

Length $\frac{1}{50}$ in. (·5 mm.).

Hab. Australia (littoral shell-sand, Melbourne). Many specimens.

Genus Cytheridea, *Bosquet.*

Animal a *Cythere*. *Carapace* subtriangular or triangularly ovate, highest usually beneath the anterior hinge. *Surface* smooth, papillose, or pitted, occasionally reticulated. *Hinge-margin* of the right valve marked by a series of small tubercles, which are received into corresponding depressions of the opposite (left) valve. These tubercles or crenulations are mostly disposed in two terminal groups (see Pl. LVIII. fig. 11 *d*, fig. 13 *d*), and the intervening portion of the valve-margin is plain or may be marked by minute tubercles on the *left* and corresponding fossæ on the *right* valve. *Ventral margin* somewhat incurved. *Lucid spots* arranged in a transverse row near the centre of the valve; mostly one or two detached spots in front of the main group.

1. Cytheridea kirkbii, n. sp. (Pl. LVIII. fig. 14, *a–c.*)

Valves oblong, oval or subtetragonal, not twice as long as broad, scarcely at all narrowed posteriorly. The *ventral margin* is nearly straight, with a slight median convexity. The anterior, posterior, and dorsal *margins* are all arched and somewhat flattened. The anterior and posterior borders are often armed on their lower portions with a series of blunt teeth, about eight in number at each end; but very frequently one or both extremities are destitute of these. *Dorsal aspect* oblong-oval. *Surface* quite smooth or marked with faint, shallow, and distant pittings, bearing also a few scattered hairs. *Lucid spots* large, angular, arranged irregularly a little in front of the centre of the valve.

Length $\frac{1}{30}$ in. (·84 mm.).

Hab. Honduras (calcareous sand, shallow water). Many specimens.

2. Cytheridea minima, n. sp. (Pl. LVIII. fig. 10, *a–d.*)

Valves triangularly ovate, convex. *Dorsal margin* well arched; *ventral* nearly straight. *Extremities* rounded. *Dorsal aspect* ovate. *Surface* perfectly smooth, milk-white.

Length $\frac{1}{75}$ in. (·36 mm.).

Hab. West Indies (shallow water). One specimen.

3. Cytheridea margaritea, n. sp. (Pl. LVIII. fig. 6, *a–d.*)

? *Cytherina ovulum*, Reuss, Haidinger's Abhandl. Band iii. p. 55, t. 8. f. 19.

Carapace ovate, convex, very broad in front, suddenly narrowed behind. *Dorsal margin* boldly arched; *ventral margin* convex, slightly sinuated at the posterior third. *Extremities* well rounded, the posterior being very narrow. *Dorsal aspect* broadly ovate, pointed in front. *Surface* smooth, pearly white, thickly set with elevated papillæ, and marked, in the adult, with patches of white opacity.

Length $\frac{1}{45}$ in. (·57 mm.).

Hab. Levant (sponge-sand). Many specimens.

Very similar to *Cytheridea aurantia*, Baird, but more profusely papillose and less tumid. It differs also in being higher in front than behind, the opposite being the case with *C. aurantia*. It agrees precisely in shape with *Cytherina ovulum*, Reuss; but the character "superficie remote scrobiculata" prevents my referring it with certainty to that species. I have seen no trace of pitting in *C. margaritea*.

4. Cytheridea (?) curta, n. sp. (Pl. LVIII. fig. 7, *a*, *b.*)

Carapace subtriangular, reniform, convex, about once and a half as long as broad. The *dorsal margin* strongly arched, somewhat gibbous in the middle. *Ventral margin* slightly concave. *Posterior border* flattened, broad, rounded at the angles. *Anterior extremity* narrow, rounded, and rather produced downwards. Seen from below, the carapace is broadly ovate, scarcely once and a half as long as broad. *Surface* smooth, sparingly papillose.

Length $\frac{1}{42}$ in. (·6 mm.).

Hab. West Indies (shallow water). One specimen.

5. Cytheridea papillosa, *Bosquet.* (Pl. LVIII. fig. 8, *a–g.*)

Cytheridea papillosa, Bosquet, Entom. Fossil. des Ter. Tertiair. p. 42. pl. 2. fig. 5.

Cythere bradii, Norman, Nat. Hist. Trans. Northumberland and Durham, vol. i. p. 15, pl. 5. figs. 5–8 (see also note, p. 28).

Carapace subtriangular, ovate, rounded anteriorly, obliquely pointed behind. *Dorsal margin* arched; *ventral margin* straight or very slightly sinuated. *Dorsal aspect* oval oblong, broadest in the middle, the extremities nearly equal. *End view* suborbicular. *Surface* of valves white, smooth or sparingly punctate, bearing a few scattered papillæ.

Lucid spots about four, in a transverse row, with one or two more detached from and in front of the main group.

Hab. Hunde Islands, 25–30 fathoms (*Dr. Sutherland*). Norway (*Messrs. M'Andrew and Barrett*) British north-eastern and north-western coasts, 20–46 fathoms.

Length $\frac{1}{30}$ in. (·84 mm.).

A species allied to *Cytheridea pinguis*, Jones. Of frequent occurrence both on the eastern and western shores of the North Sea. It is one of the commonest of living species in the deep water off the Northumberland and Durham coasts. I have also seen fossil specimens collected by Messrs. Robertson and Crosskey, of Glasgow, from the glacial clay of that district.

6. Cytheridea mülleri, *Von Münster*. (Pl. LVIII. fig. 11, *a–d.*)

Cythere mülleri, Von Münster, Leonhard und Bronn's Jahrbuch (1830), p. 62; and Neues Jahrbuch, &c. (1835), p. 446.

Cytherina mülleri, Reuss (1850), Haidinger's Abhandl. Band iii. p. 55, t. 8. fig. 21.

Cytheridea mülteri, Bosquet, Ent. Fossil. des Terrains Tertiaires, p. 39, pl. 2. fig. 4 *a–f*. Jones, Monog. Tert. Entom. p. 41, pl. 5. figs. 4, 5; pl. 6. figs. 10, 11, 12. Egger, Ostrak. der Miocän-Schicht. p. 18, t. 2. fig. 7. Speyer, Ostr. der Casseler-Tertiärbild. p. 48, t. 1. fig. 8.

Valves elongated, siliquose, tapering to the posterior extremity, twice as long as broad. *Anterior border* rounded, and armed with a variable number of sharp spines. *Dorsal margin* arched, and forming a regular curve as far as the posterior ventral angle, which is somewhat produced. The *ventral margin* is straight or gently sinuated. *Dorsal profile* oval. The *surface* of the shell is marked with subquadrate pits arranged in longitudinal series.

Length $\frac{1}{35}$ in. (·74 mm.).

Hab. Mouth of Hermus, Smyrna; Australia.

Genus Cythere, *Müller*.

Carapace mostly convex, varying in outline, but mostly oval or irregularly oblong, and highest beneath the anterior hinge, the anterior (and sometimes the posterior) hinge forming indistinct angles on the dorsal margin. The *hinge* occupies the middle portion of the dorsal margin, and consists, on the right side, of a ridge with two terminal teeth, the anterior of which is the most strongly developed. The hinge-margin of the left valve exhibits two fossæ for the reception of the teeth of the right valve. The anterior fossa sometimes forms a complete circular perforation of the marginal plate. Between the terminal depressions there is a longitudinal groove adapted to the bar of the opposite valve, and also two terminal projections, much smaller than those of the right valve. The bar and furrow are in many cases obsolete. The *edges* of the carapace are often produced into thin projecting laminæ, especially on the anterior and

ventral margins. The lower portion of the posterior border often much produced and toothed. *Surface* of the valves smooth or marked with all varieties of sculpture.

1. Cythere setosa, *Baird.* (Pl. LVIII. fig. 12, *a–c*; fig. 13, *a–d*; fig. 15, *a–e.*)

Cythere setosa, Baird, Proceedings of Zoological Society of London, part xviii. 1850, p. 258; Annulosa, pl. 18. f. 28–30.

Valves oblong-oval or subreniform, compressed, highest at anterior third, surrounded wholly or in part by a broad flattened fillet. *Dorsal margin* arched, somewhat flattened. *Ventral margin* sinuated. *Extremities* broad, obliquely rounded. *Dorsal aspect* oblong-oval, keeled, often slightly indented near the middle. *End view* broad, oval. *Surface* smooth or slightly pitted, and bearing a few short hairs.

Length $\frac{1}{50}$ in. (young), $\frac{1}{35}$–$\frac{1}{30}$ in. (adult), (·5–·74–·84 mm.).

Hab. Hunde Islands (*Dr. P. C. Sutherland's dredgings*). Levant.

2. Cythere jurinei, *Von Münster.* (Pl. LIX. fig. 1, *a–f.*)

Cythere jurinei, Von Münster, Leonh. & Bronn's Jahrbuch, 1830, p. 62. Bosquet, Entom. Fossil. des Terr. Tertiair. de la France, p. 56. pl. 2, fig. 9. Speyer, Ostrac. der Casseler-Tertiärbild. p. 15. t. 2. fig. 5.

Oblong, convex; extremities equal, or nearly so. *Dorsal margin* straight, *ventral* slightly sinuated. *Extremities* obliquely rounded. *Dorsal profile* elongate, ovate. *Surface* of the valves marked with shallow (scarcely excavated) longitudinal grooves, along which are scattered faintly marked pittings. *Lucid spots* about six, rather small, circular, arranged in two transverse rows.

Length $\frac{1}{30}$ in. (·84 mm.).

Hab. Levant (sponge-sand).

This is a well-marked species, which, however, varies considerably in the amount of surface-marking, the grooving and pitting being often almost or entirely obsolete. The longitudinal striæ are very shallow, more like facets than grooves, looking as if they might have been produced with a joiner's plane rather than with a gouge. The pittings, when well marked, remind one strongly of the appearance of a section of coniferous wood under the microscope.

Var. costata. (Pl. LIX. fig. 2, *a–d.*)

Oblong, subquadrangular. *Extremities* obliquely rounded, the anterior being broadest. *Dorsal* and *ventral margins* nearly straight, the former sloping backwards from the anterior hinge-joint. *Dorsal aspect* oblong subovate, only slightly narrowed in front: outline somewhat sinuous. *Surface* marked with delicate longitudinal ridges, which, on the central portion of the valves, are connected at distant intervals by oblique cross-ridges. The furrows are dotted with small pits, often arranged in pairs.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Levant (sponge-sand).

Extreme forms of this variety are very distinct from well-marked examples of the typical *C. jurinei*; but in the gathering from which my specimens were taken there occur many individuals intermediate between the two. This, with the smaller size and more delicate marking of the variety *costata*, leads me to infer that it is only the young or a variety of *C. jurinei*.

3. Cythere hodgii, n. sp. (Pl. LIX. fig. 3, *a*, *b*.)

Carapace oblong-oval, convex. *Dorsal* and *ventral margins* gently arched. The *anterior border* is well rounded, forming a flattened lamina, and is armed inferiorly with several short, blunt teeth. *Posterior border* narrowed, bearing three spines, one of which is very long. *Dorsal aspect* ovate. *Surface* of the shell smooth, marked on its posterior half with longitudinal rows of pittings, which partially coalesce so as to form moniliform furrows.

Length $\frac{1}{33}$ in. (·79 mm.).

Hab. Levant (sponge-sand). One specimen.

4. Cythere (?) mamillata, n. sp. (Pl. LIX. fig. 6, *a–c*.)

Oblong, subreniform, broadest in front, twice as long as broad. *Anterior margin* well rounded, produced downwards below the level of the ventral margin; *posterior margin* narrow, bent in the middle at an obtuse angle. *Dorsal margin* arched; *ventral margin* straight. *Dorsal profile* oval. *Surface* of the valves minutely punctate, and raised into several irregularly placed, rounded elevations or mamillæ.

Length $\frac{1}{80}$ in. (·32 mm.).

Hab. Atlantic Ocean, 110 fathoms. One valve.

5. Cythere oblonga, n. sp. (Pl. LIX. fig. 5, *a–d*.)

Carapace oblong, quadrilateral, convex, more than twice as long as broad. *Extremities* truncate, anterior obliquely rounded and often toothed, posterior obliquely flattened, produced and often serrated inferiorly. *Dorsal margin* slightly convex, *ventral* incurved along its whole length. *Dorsal aspect* broadly oval. *End view* oval, broadest in the horizontal diameter. *Surface* of valves marked with somewhat distant, oblong, pittings.

Length $\frac{1}{30}$ in. (·84 mm.).

Hab. Levant (sponge-sand). Several specimens.

6. Cythere canaliculata, *Reuss*. (Pl. LIX. fig. 4, *a–f*.)

Cypridina canaliculata, Reuss, Haidinger's Abhandl. iii. p. 76, t. 9. fig. 12.
Cythere canaliculata, Egger, Ostrak. der Miocän-Schicht. p. 33, t. 5. figs. 10, 11.

Carapace oblong, sigmoid, compressed. *Extremities* well rounded, the anterior distantly and bluntly serrated. The antero-inferior and postero-superior angles somewhat

produced. *Dorsal margin* slightly arched, *ventral* sinuate. *Dorsal profile* elongate, oval, truncate behind; contact margins depressed so as to form a deep elongated sulcus posteriorly. *Surface* deeply excavated into large irregularly sinuous pits.

Length $\frac{1}{60}$ in. (·42 mm.).

Hab. Hobson's Bay, Australia.

7. Cythere venata, n. sp. (Pl. LIX. fig. 8, *a–c.*)

Carapace elongated, broad in front. Anterior margin rounded, feebly and distantly serrated. Posterior margin very narrow, sharply rounded. Dorsal margin arched, having a conspicuous gibbosity over the anterior hinge. Ventral margin sinuated. *Dorsal aspect* ovate, with produced extremities. Valves smooth, marked with anastomosing ridges, the principal of which are thus distributed:—three rising beneath the dorsal protuberance, and running parallel with the anterior margin until lost on the inferior aspect; three longitudinal ribs rising in two loops near the posterior extremity, running forwards and fading out about the middle of the valve; and one rib parallel with the posterior and part of the ventral margin.

Length $\frac{1}{50}$ in. (·5 mm.).

Hab. Hobson's Bay, Australia. A few specimens.

A small species, the surface-markings of which vary considerably, its most conspicuous character being a faint longitudinal venation. In some specimens the surface is also raised into slight eminences or undulations.

8. Cythere plicatula, *Reuss.* (Pl. LX. fig. 1, *a–c.*)

Cypridina plicatula, Reuss (1849), Haidinger's Abhandl. iii. p. 44, t. 10. fig. 23.
Cythere plicatula, Bosquet (1850), Ent. Foss. des Terr. Tertiair. de la France, p. 92, pl. 4. fig. 13.

Carapace oblong, subquadrangular. Dorsal and ventral margins nearly parallel, the latter slightly sinuated, the former arched and gibbous anteriorly. Anterior extremity rounded; posterior nearly straight, armed with several (four) strong teeth, which project straight backwards. *Surface* pitted, marked with four distinct longitudinal ribs. *Dorsal aspect* oval-oblong.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Smyrna (shallow water). Levant (sponge-sand).

9. Cythere catenata, n. sp. (Pl. LX. fig. 2, *a–d.*)

Carapace subtriangular, once and a half as long as broad; broadest in front, and encircled, except on the dorsal margin, with a flattened lamina or fillet. The ventral and dorsal margins converge towards the posterior extremity, which is rounded and narrow. Anterior margin broad and well rounded. The *dorsal aspect* is ovate, narrowed in front. The *surface* of the valves is ornamented with minute tubercles arranged

over the central portion in an angular network; but towards the margins the pattern becomes more lax, longitudinal rows taking the place of the meshes.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Norway (*Messrs. M'Andrew and Barrett's dredgings*).

Cythere kostelensis, Reuss, as figured by Egger (Die Ostrak. der Miocän-Schicht. t. 4. fig. 4), is very similar in form and general characters to our *C. catenata*. Reuss's original figure is, however, very different; and both authors concur in ascribing to *C. kostelensis* a *pitted* surface, the former adding that minute tubercles are found between the "thickly set pores," which on the ventral surface are replaced by delicate furrowings. *C. catenata*, however, is wholly devoid of pittings, and is ornamented only with minute projecting spines or bosses.

10. Cythere septentrionalis, n. sp. (Pl. LX. fig. 4, *a–f.*)

Oblong, subquadrilateral, convex. Anterior margin broad and obliquely rounded; posterior narrower and somewhat flattened. Dorsal margin straight, with a slight convexity in the middle, and sloping gently backwards from the anterior hinge. Ventral margin somewhat convex. *Surface* marked with large angular pittings, which gradually coalesce towards the margins, forming on the ventral surface sharply cut longitudinal furrows. The pitted or reticulated sculpture prevails on the central parts of the dorsal and lateral aspects; but over the whole ventral surface longitudinal grooving only is visible. *Dorsal aspect* ovate. *End view* broadly ovate, flattened and grooved below.

Length $\frac{1}{20}$ in. (1·27 mm.).

Hab. Hunde Islands, 60–70 fathoms (*Dr. P. C. Sutherland's dredgings*). Many specimens.

This is possibly allied to a Tertiary (Eocene) species, *C. scrobiculata*, Münster. There is, indeed, less difference between the recent *C. septentrionalis* and some figures of the fossil *C. scrobiculata* than between some of the fossil forms referred by different authors to the latter species. Dr. Baird remarks also that his *C. quadridentata* is nearly allied to *C. scrobiculata* as originally described by Von Münster. It is, however, very widely different from the present species. The marks which I should especially insist upon as diagnostic of *C. septentrionalis* are the strong development of the anterior hinge, and the oval outline and distinct longitudinal fluting of the ventral aspect. But the whole group to which it belongs is a perplexing one, its various members running into each other by imperceptible gradations, which, to my mind, speak plainly of one common origin.

11. Cythere costata, n. sp. (Pl. LX. fig. 5, *a–f.*)

Carapace compressed, oblong, narrowed posteriorly. Anterior margin rounded, and

occasionally fringed with hairs; posterior margin rounded, bearing four or five short processes or tubercles on its inferior portion. Dorsal margin arched, irregularly sinuous, highest at its anterior third. Inferior margin nearly straight, with a slight median convexity. *Dorsal aspect* compressed, angular, oblong-ovate. *End view* subquadrangular, compressed, about once and a half as long as broad. *Surface* of the valves marked with several conspicuous ridges, one of which runs longitudinally along the ventral margin, another in a curve parallel with the anterior border, and two or three more in an oblique direction from the ventral ridge towards the dorsum. Between the primary ribs the shell is marked with large subquadrate pits or reticulations.

Length $\frac{1}{25}$ in. (1·05 mm.).

Hab. Hunde Islands, 60–70 fathoms (*Dr. Sutherland*).

Cythere neptuni (Egger) seems to be the nearest described relative of this fine species.

12. Cythere clathrata, *Reuss.* (Pl. LIX. fig. 9, *a–c*; fig. 10, *a–c*; fig. 11, *a–d*; fig. 12, *a–c*; fig. 13, *a–c*.)

Cypridina clathrata, Reuss (1849), Haidinger's Abhandl. iii. p. 71, t. 9. fig. 31.

Cythere lyrata, Reuss, Beiträge zur Charak. der Tertiär-Schicht. des nördl. u. mittl. Deutschlands, p. 62, t. 10. fig. 99. Speyer, Ostrac. der Casseler-Tertiärbild. p. 25, t. 3. f. 4.

Cythere latimarginata, Speyer, Ostrac. der Casseler-Tertiärbild. p. 22, t. 3. fig. 3.

Carapace oblong, subquadrilateral, somewhat ear-shaped, broadest in front. There is a conspicuous rounded tubercle a little in front of the centre of the valve, and two large elongated eminences considerably behind the centre, which coalesce so as to form a much elevated transverse ridge. This ridge is continued forwards more or less distinctly along the ventral margin. The anterior margin of the carapace is obliquely rounded and armed, in the adult, with a series of equal rounded teeth, varying from about fifteen to thirty in number. Posterior margin narrow, rounded, and produced at its inferior angle, where it bears a few (mostly five or six) teeth. Ventral margin straight or slightly convex. Dorsal margin straight, often corrugated, and sloping backwards from the anterior hinge. *Dorsal aspect* oblong, angularly ovate or subquadrilateral. *Surface* (in the adult) marked with closely set and tolerably large pittings or reticulations.

Length $\frac{1}{35}$–$\frac{1}{28}$ in.

Hab. Hunde Islands (vars. *nuda*, *latimarginata*, *lyrata*). Norway (*C. clathrata*, and vars. *nuda*, *latimarginata*).

The number of species which I have thought it necessary to include under the specific designation of "*clathrata*" might, I believe, be fairly increased by the addition of two more species, *Cythere hexangulatopora*, Speyer, and *C. bornemanni*, Speyer. The characters upon which these and the previously quoted species rest appear to depend partly upon local variation, but chiefly upon the age of the specimen. I have arrived at this conclusion from the careful examination of a large number of specimens of all

ages; and, so far as I have been able to ascertain, the following changes may generally be observed in tracing upwards a series of specimens from the youngest to the fully formed adult.

In the young state the valves are very fragile, pellucid, smooth, and much elongated; the anterior margin is produced into a wide, projecting, flattened border, and the posterior margin is likewise considerably produced at its inferior angle: the three tubercles on the lateral aspect of the valves are very large and conspicuous. This state, which I propose to call var. *nuda*, is represented in Pl. LIX. figs. 9 & 10. In a further advanced stage of growth the surface-markings (pittings or reticulations) become apparent, the tubercles more fused together and less prominent, and there is a wide, flattened, marginal border nearly or quite round the shell. At the same time the general outline is more rounded, and the terminal teeth begin to appear. In this stage it is referable to *C. latimarginata*, Speyer (Pl. LX. fig. 13, *a–c*). In the mature state the teeth are more numerous; the flattened marginal belt is, in great measure, lost; the reticulations or pittings are well developed, and the tubercular eminences less conspicuous. This stage of growth coincides with *C. lyrata*, Reuss, and is shown in Pl. LIX. fig. 12, *a–c*. In extremely old specimens the surface-markings become almost obsolete, being either worn away by attrition or perhaps obliterated by constant deposit of new shell in the interstices of the sculpture. The difficulty of investigating these closely related forms has been considerably increased by the mutilated condition of most of the specimens. It is seldom that I have been able to meet with perfect shells, the valves being almost always separated. On this account the figures of the dorsal and ventral aspects of the different varieties are not so complete as I could have wished. My observations of their development have been made, therefore, to a considerable extent on an undescribed British species (*C. mutabilis*, Brady, MS.) which is nearly allied to the present. Several stages of the growth of this form are figured in Pl. LIX. fig. 14, *a–h*. The varieties there shown (which, it can scarcely be doubted, are dependent chiefly upon stages of growth, but partly also upon habitat) have their precise counterparts amongst the Norwegian and Arctic specimens, also figured in Pl. LIX.

13. Cythere lactea, n. sp. (Pl. LX. fig. 3, *a–c*).

Carapace quadrangular, convex. Extremities nearly equal; anterior rounded, posterior flattened and produced along its lower half. Dorsal and ventral margins nearly straight, slightly sinuate. The lateral aspect of the valves exhibits a very large rounded tubercle, connected with a posterior transverse ridge by a longitudinal eminence. A flattened belt runs round the anterior margin, and is crossed at intervals by short ridges. *Dorsal profile* angular, oval, very broad. *Surface* of the shell closely reticulated.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Australia (17 fathoms, in sand). One specimen.

Var. RUDIS. (Pl. LX. fig. 6, *a–c.*)

More rounded in outline; the tubercles and ridges of the carapace obsolete. *Surface* undulated, marked with large oval pittings, chiefly on the anterior half of the valves. Posterior extremity bearing a few small teeth.

Length $\frac{1}{68}$ in. (·36 mm.).

Hab. Atlantic Ocean (223 fathoms, *Commander Dayman's soundings*).

The form which I have named *rudis* appears in all important characters to agree with the present species (*C. lactea*). Probably the paucity and indistinctness of its surface-markings may be attributed to the combined effects of old age and peculiarity of habitat.

14. CYTHERE PUMILA, n. sp. (Pl. LX. fig. 7, *a–d.*)

Carapace compressed, oblong, quadrilateral. Anterior extremity broad, obliquely rounded; posterior narrow, flattened, produced below. *Ventral* and *dorsal margins* nearly straight. Seen from below, the outline of the carapace is compressed, oblong, with parallel sides and truncated pyramidal extremities. *Surface* covered with strong, irregularly disposed ribs, marking out about four large and several smaller fossæ, and dividing somewhat dichotomously towards the anterior margin.

Length $\frac{1}{48}$ in. (·54 mm.).

Hab. Australia. One specimen.

15. CYTHERE PRODUCTA, n. sp. (Pl. LIX. fig. 11, *a–d.*)

Carapace oblong, quadrilateral, convex; extremities equal. Anterior margin rounded, forming a flattened border, which is much produced at the ventral angle. Inferior half of the posterior border produced backwards into an irregularly toothed process. Dorsal and ventral margins parallel, nearly straight. *Dorsal aspect* ovate. *Surface* of the valves marked with quadrangular pits arranged in longitudinal rows, and becoming obsolete towards the dorsal margin.

Length $\frac{1}{35}$ in. (·74 mm.).

Hab. Honduras (shallow water in calcareous sand).

16. CYTHERE PAVONIA, n. sp. (Pl. LXI. fig. 2, *a–d.*)

Carapace oblong, compressed, rather gibbous in the centre, ending posteriorly in an oblique ridge, which forms three crescentiform excavations near the lower posterior angle. The anterior border is broad and well rounded; the posterior narrow, oblique, and emarginate. Dorsal margin nearly straight; ventral slightly sinuated. The *ventral profile* is compressed, lanceolate, showing on the posterior half of each valve three large and deep circular fossæ, which are surrounded by elevated borders. These, seen in profile, form the crescentic ridges which are visible on the lateral aspect. Valves

marked with longitudinal rows of punctations, coalescing on the ventral surface into grooves or striæ. *End view* cordate.

Length $\frac{1}{48}$ in. (·54 mm.).

Hab. Levant (sponge-sand).

17. Cythere pumicosa, n. sp. (Pl. LXI. fig. 3, *a–c.*)

Carapace oblong, convex, quadrilateral, considerably elevated, and marked more or less distinctly with two sigmoid ridges and an intervening depression. Anterior margin broad, somewhat flattened, with rounded angles; posterior rounded, denticulate. Dorsal margin nearly straight; ventral slightly sinuated. *Dorsal profile* ovate. Surface-sculpture consisting of angular excavations of irregular shape, but mostly oblong and disposed in longitudinal series.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Turk's Island (shallow water).

18. Cythere cribriformis, n. sp. (Pl. LXI. fig. 6, *a–d.*)

Subquadrangular, trapezoid, convex; *margins* (except the ventral) strongly and irregularly toothed. *Extremities* straight, with rounded angles, converging towards the dorsum. Dorsal border straight; ventral convex, emarginate, and nearly devoid of spines. Dorsal aspect broadly ovate. *Surface* of the carapace covered with a strong, elevated reticulation enclosing angular cells of irregular shape, the whole structure being very similar in appearance to the calcareous plates of some of the sea-cucumbers.

Length $\frac{1}{35}$ in. (·74 mm.).

Hab. Levant (sponge-sand). One specimen.

19. Cythere normani, n. sp. (Pl. LXI. fig. 5, *a–d.*)

Carapace convex, trapezoid in outline. Dorsal and ventral margins slightly arched outwards. Anterior margin beset, along its inferior half, with long, blunt teeth. Posterior margin armed with two or three strong teeth and several smaller ones. *Dorsal aspect* oval, with several projecting spines towards the extremities. *Surface* covered with a network of sharply defined ribs, crossing each other nearly or quite at right angles, but becoming less distinctly angular towards the edges of the valves. A sharp keel, bearing posteriorly a single strong spine, runs along the lower border, and mostly bifurcates on the ventral aspect, the upper branch being continued along the posterior border of the valve to the dorsal margin, thus bounding the reticulated portion of the shell.

Length $\frac{1}{33}$ in. (·78 mm.).

Hab. Abrolhos Bank. Several specimens.

The only described species which bears any close resemblance to the present is *C. arachnoidea*, Bosquet. It differs from *C. normani* in outline, also in having a row of

conspicuous tubercles along the ventral margin, in place of the simple ridge which characterizes the present species. *C. arachnoidea* bears also small tubercles at the points of intersection of the surface network, and another row of them just within the finely serrated anterior border.

I have inscribed this species to my friend the Rev. A. M. Norman, whose numerous contributions to carcinology and other branches of science are widely known, and to whom I am indebted for much valuable help in the study of natural history.

20. Cythere scabra, *Von Münster*. (Pl. LXI. fig. 8, *a–d.*)

Cythere scabra, Von Münster (1830), Jahrbuch für Mineralogie, p. 63. Bosquet, Entom. Fossil. des Terr. Tertiair. de la France, p. 105, pl. 5. fig. 7. (?) Egger, Ostrak. der Miocän-schicht, p. 26, t. 4. f. 10.

Carapace oval, broadest in front. Extremities well rounded. Dorsal and ventral margins slightly arched. *Dorsal outline* ovate. *Surface* thickly covered with spines, which vary considerably in size, and give a rough, bristling appearance to the whole shell.

Length (Atlantic) $\frac{1}{25}$ in. (1 mm.), (Abrolhos) $\frac{1}{33}$ in. (·78 mm.), (Crete) $\frac{1}{45}$ in. (·57 mm.).

Hab. Atlantic, 2050 fathoms (*Com. Dayman*); Abrolhos; Crete (mud) 360 fathoms (*Capt. Spratt*).

21. Cythere parkeri, n. sp. (Pl. LXII. fig. 1, *a–e.*)

Quadrilateral, convex, once and a half as long as broad. All the margins gently arched, and terminating in obtuse angles. *Dorsal aspect* broadly oval; margins slightly serrated: a stout, blunt tooth or tubercle on each valve in the position of the anterior hinge. The lateral separated from the ventral surface by a rounded keel or angle. *End view* subpyramidal; angles rounded; lower border flat. *Surface* pitted.

Length $\frac{1}{45}$ in. (·571 mm.).

Hab. Australia. Several specimens.

I have pleasure in inscribing this species to W. K. Parker, Esq., to whom I am indebted for the opportunity of describing many of the species noticed in this paper.

22. Cythere compacta, n. sp. (Pl. LXII. fig. 3, *a–d.*)

Carapace subtriangular, scarcely once and a half as long as broad. Anterior extremity broad, obliquely rounded; posterior narrow, angular. Ventral margin convex; dorsal margin highest at anterior third, arched, somewhat angular. *Dorsal outline* oval, with truncate extremities. The ventral ridge is most conspicuous behind, where it crosses the shell transversely in an irregular line, and is continued along the dorsal margin. *End view* subquadrilateral. *Surface* marked by strong reticulations enclosing large quadrangular pits.

Length $\frac{1}{50}$ in. (·508 mm.).

Hab. Turk's Island (shallow water).

23. Cythere areolata, n. sp. (Pl. LXII. fig. 2, *a–d*.)

Triangular, oblong, cuneiform. Ventral margin convex; dorsal margin elevated and angular at the anterior hinge, forming two or three rounded protuberances behind. The posterior border is very narrow and rounded off; the anterior broad, arched, and angular at its extremities. *Dorsal aspect* ovate, angular, keeled. *End view* triangular, its angles well marked, base convex. *Surface* of shell finely punctate, and marked out into small areolæ by a delicate reticulated ribbing. Near the middle of the valve is a strong longitudinal rib, and one or two smaller ones between it and the ventral margin. On the dorsal side of the median rib the valve is covered with numerous large, tubercular elevations.

Length $\frac{1}{50}$ in. (·508 mm.).

Hab. Hunde Islands, 25–30 fathoms (*Dr. Sutherland*).

In outline and general characters this agrees closely with *C. plicata* as figured by Reuss. The prominent tuberculation which exists in the present species, however, seems sufficient to give it a distinct specific rank, the only markings of the typical *C. plicata* being described by the terms "*tricostato, punctato*." The species referred by M. Bosquet to *C. plicata*, Reuss, is certainly widely different from the present.

24. Cythere rhomboidea, n. sp. (Pl. LXII. fig. 5, *a*, *b*.)

Obliquely quadrilateral, convex. Borders of the valves convex, irregularly sinuated; angles rounded. Ventral ridge sharply defined. *Dorsal profile* broadly ovate, with subacute extremities. *Surface* irregularly undulated, obscurely pitted in patches.

Length $\frac{1}{80}$ in. (·317 mm.).

Hab. Atlantic Ocean, 43 fathoms (*Com. Dayman's soundings*).

The specimen from which this description is taken is probably old and worn; but it seems to be quite distinct from any hitherto described species. Its nearest relative is probably *Cythere triangularis*, Reuss; or rather the species figured by Professor T. Rupert Jones under that name (Monog. Tert. Entom. pl. 6. fig. 5).

25. Cythere latissima, *Norman*. (Pl. LXII. fig. 4, *a–e*.)

Cythere latissima, Norman, Nat. Hist. Trans. Northumberland and Durham, vol. i. p. 19, pl. vi. fig. 8.

Carapace triangular, very tumid, once and a half as long as broad. The valve inclines rapidly outwards from the dorsum, forming at the ventral border a bold curved ridge, which loses itself on the surface of the valve near each extremity. Anterior and posterior margins produced, rounded, the latter very narrow. Dorsal margin boldly arched, highest in the middle. *Dorsal outline* subquadrate, with produced, subacute extremities. *End view* triangular; sides convex; base somewhat concave;

angles acute. *Surface* marked with oblong, angular pittings, which tend to run into transverse striæ.

Length $\frac{1}{40}$ in. (·635 mm.).

Hab. Hunde Islands, 25–30 fathoms (*Dr. Sutherland*).

Genus Normania, nov. gen.

Animal like *Cythere*: limbs long and slender; antennæ bearing long filaments, and quite devoid of spines. Outline of carapace flexuous, obliquely oval or subtetragonal ("peach-stone" shaped). *Valves* convex, produced round the whole, or at parts only, of their circumference into a flattened laminar border. *Dorsal outline* oval, tapering at both extremities, often strongly keeled. *Hingement* as in *Cythere* proper; the terminal processes somewhat feebly developed, with mostly an intervening, finely crenulated bar. *Surface* smooth, punctate or papillose, the sculpturing having mostly a concentric arrangement.

1. Normania avellana, n. sp. (Pl. LXI. fig. 15, *a–c.*)

Carapace obliquely oval. *Dorsal margin* gently arched; *ventral* obliquely convex, sinuated anteriorly. *Anterior border* obliquely rounded; *posterior* narrow, obliquely truncate and sinuated rather deeply in the middle. *Dorsal profile* oval, keeled. *Surface* marked with large and thickly set pittings.

Length $\frac{1}{35}$ in. (·74 mm.).

Hab. West Indies. One specimen.

This approaches, perhaps too closely, *Cythere cicatricosa*, Reuss; but, so far as I can judge from the figures given by Reuss and Bosquet, there seems sufficient difference, both in form and sculpturing, to warrant my considering it a distinct species.

2. Normania affinis, n. sp. (Pl. LXI. fig. 12, *a–d.*)

Carapace obliquely quadrilateral, convex. *Anterior* and *posterior extremities* nearly equal, obliquely rounded, the latter produced inferiorly into a broad, flattened lamina, which is continued along the posterior portion of the ventral margin, vanishing in the middle and reappearing in front, whence it is continued round the anterior margin. *Dorsal* and *ventral margins* parallel, straight or slightly sinuated. *Dorsal aspect* oval, broad in the middle; extremities pointed. *Surface* of the valves covered with closely set, deep punctations, which, on the ventral surface, coalesce so as to form longitudinal furrows.

Length $\frac{1}{42}$ in. (·6 mm.).

Hab. Levant (sponge-sand); common.

3. Normania glabra, n. sp. (Pl. LXI. fig. 11, *a–d.*)

Valves obliquely quadrilateral, excessively convex in the centre, with a wide, flattened

border, which is much produced anteriorly. *Dorsal margin* nearly straight; *ventral margin* convex, sinuated at its anterior third. *Extremities* narrow, rounded. *Dorsal outline* broadly oval, with produced, pointed extremities. *Surface* smooth, polished, bearing distant scattered papillæ. *Lucid spots* about four, somewhat obliquely placed near the centre of the valves.

Length $\frac{1}{42}$ in. (·6 mm.).

Hab. Levant (sponge-sand). Several specimens.

4. Normania grisea, n. sp. (Pl. LXI. fig. 10, *a–c*.)

Carapace obliquely quadrilateral, convex. *Dorsal* and *ventral margins* convex, the latter slightly sinuate posteriorly. *Anterior extremity* broad, rounded, bordered by a flattened lamina. *Posterior extremity* narrowed, rounded. *Dorsal profile* oval, with acute extremities. *Surface* smooth, finely and sparingly punctate; the punctations surrounded by areolæ of a lighter colour than the rest of the shell.

Length $\frac{1}{50}$ in. (·508 mm.).

Hab. Smyrna (shallow water). One specimen.

5. Normania modesta, n. sp. (Pl. LXI. fig. 13, *a*, *b*.)

Valves oblong-oval, convex. *Extremities* obliquely rounded and narrowed; the anterior produced into a flattened lamina, the posterior obliquely truncate above. The *dorsal margin* is straight; the *ventral* convex, and indented at its junction with the flattened anterior border. *Surface* punctate. *Dorsal profile* ovate-oblong, with somewhat pointed extremities, slightly keeled.

Length $\frac{1}{48}$ in. (·58 mm.).

Hab. Smyrna (shallow water). One specimen.

6. Normania dorso-tuberculata, n. sp. (Pl. LXI. fig. 14, *a–g*.)

Carapace obliquely quadrilateral, convex. Anterior extremity compressed, rounded; posterior broad, obliquely rounded. Ventral margin arched, sinuate at anterior third; dorsal margin straight behind, sloping steeply in front. *Dorsal outline* ovate: on each side of the median line posteriorly there is a large tubercular elevation, directed backwards. In front of this, and extending nearly to the posterior extremity, is a row of minute spines running parallel to the hinge-margin of each valve. Some specimens exhibit an additional tubercle on the centre of each valve.

Length $\frac{1}{45}$ in. (·57 mm.).

Hab. West Indies (shallow water). Several specimens.

Genus Cythereis, *Jones* (subgenus).

Animal unknown. *Valves* quadrilateral, longitudinally rugose or tuberculated, bordered with elevated ridges or rows of spines; the tubercle over the anterior hinge strongly developed. *Hinge joint* as in *Cythere*; the bar and furrow obsolete.

1. Cythereis batei, n. sp. (Pl. LX. fig. 8, *a–d.*)

Valves oblong, quadrilateral, compressed. Anterior margin elevated, rounded, irregularly waved and dentate. Posterior extremity narrowed, produced inferiorly into a thin, rugose lamina which, at its edge, is broken into irregular dentations. Dorsal and ventral margins nearly straight. Viewed *from below*, the carapace exhibits a central quadrilateral portion, traversed in the median line by a broad keel (the hinge-margins) which projects considerably before and behind, forming broad, truncate prolongations. The lateral surface of each valve is marked by a strong longitudinal median ridge, which is puckered and dentate.

Length $\frac{1}{33}$ in. (·78 mm.).

Hab. Levant (sponge-sand).

I have pleasure in naming this very distinct species after Mr. C. Spence Bate, of Plymouth.

2. Cythereis cristatella, n. sp. (Pl. LXI. fig. 1, *a–d.*)

Carapace compressed, oblong, bearing a central longitudinal eminence. The *margins* are much elevated, particularly at the extremities. The *extremities* are well rounded (the anterior being a little the broadest), and at their lower margins are slightly serrated. The *dorsal* and *ventral margins* are sinuated in the middle, and about the anterior third of the dorsal edge there is a marked angular elevation. Dorsal outline compressed, hastate, with a broad, projecting keel. Surface smooth.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Australia.

3. Cythereis subcoronata, *Speyer.* (Pl. LX. fig. 9, *a–e.*)

Cythere subcoronata, Speyer, Ostrac. der Cassel. Tertiärbild. p. 38, t. 4. figs. 9, 10.

Valves oblong oval, compressed, much elevated in the centre, twice as long as broad. Dorsal and ventral margins straight or but slightly convex. Anterior margin broad and somewhat flattened. Posterior margin rounded, armed with about nine strong teeth, which increase in size towards the ventral margin. *Dorsal profile* elongate oval, very prominent in the middle, tapering rapidly to the extremities. *Surface* of the valves smooth and polished, rising to a peak near the middle of the ventral border. A broad flattened border encircles the central elevated portion, and is beset at intervals with strong square teeth. Within the ventral margin is a row of rounded tubercles, five, six, or more in number, and the dorsal margin is irregularly armed with blunt, square teeth. *End view* pyramidal.

Length $\frac{1}{30}$ in. (·84 mm.).

Hab. Smyrna (shallow water). Three or four specimens.

In surface-ornament this does not exactly agree with Speyer's figures of *C. subcoro-*

nata, but is so near as to be fairly referable to that species. The recent specimens are deficient in the spines which beset the posterior half of the valves of the fossil species; and the marginal rows of spines appear also to be less fully developed, though still following the same distribution.

4. Cythereis militaris, n. sp. (Pl. LXI. fig. 9, *a–d.*)

Carapace oblong, broadest in front. Anterior margin boldly rounded, gibbous at the dorsal angle. Posterior extremity rounded, narrow. Dorsal margin sloping backwards, much elevated at the anterior hinge. Ventral border rather convex. *Dorsal aspect* oval, with acutely tapering extremities; on each valve two spinous ridges, the last spine of each being very long and strong. *Surface* of the valves smooth and polished, bearing, a little below the centre, a longitudinal row of six or seven spines, the hindermost of which is very long and pointed. The anterior margin bears a beautifully regular row of similar teeth, twenty in number, commencing at the dorsal protuberance, and ceasing directly below that point on the ventral margin, which is fringed by a row of equally regular but much smaller teeth nearly to the posterior angle, where they give place to four longer, curved spines. The posterior margin is irregularly spinous. The dorsal margin bears a series of seven strong spines, beginning at the anterior hinge and increasing in length from the first to the last, which is situated at a considerable distance from the hinder extremity.

Length $\frac{1}{50}$ in. (·5 mm.).

Hab. Hobson's Bay, Australia.

5. Cythereis lacerata, n. sp. (Pl. LXI. fig. 4, *a–e.*)

Oblong, subquadrilateral, nearly twice as long as broad. Anterior and posterior margins beset with strong, blunt spines, the former rounded, the latter angular. Dorsal margin arched, highest at the anterior hinge; ventral straight. *Dorsal profile* oval, spinous in front and behind. *Surface* of the shell wrinkled, covered with elevated, sinuous laminæ, the edges of which are irregularly waved or jagged. On each valve three or four of these laminæ are strongly developed, one of them forming a strong dorsal ridge.

Length $\frac{1}{30}$ in. (·84 mm.).

Hab. Abrolhos Bank.

6. Cythereis fungoides, n. sp. (Pl. LXI. fig. 7, *a–d.*)

Quadrangular, trapezoid, convex. Dorsal and ventral margins parallel, irregularly cut and waved. Extremities oblique, slightly rounded, unequally dentate. *Dorsal aspect* broadly oval, angular, displaying three longitudinal ridges on each valve; the hinge-margins or keel broad, much expanded and angular posteriorly. *Surface* of the

valves covered with irregular, sinuous, projecting laminæ, the free edges of which are variously cut and cleft.

Length $\frac{1}{40}$ in. (·63 mm.).

Hab. Australia, 14 fathoms.

7. Cythereis spinosissima, n. sp. (Pl. LX. fig. 10, *a–e.*)

Valves compressed, oblong-oval, twice as long as broad. Dorsal and ventral margins nearly parallel, slightly arched. Anterior margin obliquely rounded, bearing five or six large, blunt teeth. Posterior margin narrower, rounded, bearing about eight blunt teeth and one very long pointed spine at the ventral angle. *Dorsal aspect* ovate, with irregularly dentated outline and tapering extremities. *Surface* of the valves beset with blunt processes, which are crowded together in irregular rows, producing a resemblance to the growth of a lichen or nullipore.

Length $\frac{1}{25}$ in. (1 mm.).

Hab. Norway (*Messrs. M'Andrew and Barrett's dredgings*).

This species approaches in general aspect *C. lichenopora*, Bosquet; but the ventral aspect, instead of being marked with rows of excavations (as in *C. lichenopora*), bears several series of stout, sharp spines.

Family CYPRIDINIDÆ.

Genus Cypridina, *Milne-Edwards.*

Eyes two; antennæ two; feet two pairs. Abdomen terminated by a broad lamellar plate, armed with claws and spines. Carapace consisting of two distinct valves; produced in front into a more or less prominent beak, with a subajacent hollow or notch facing the ventral margin.

1. Cypridina japonica, n. sp. (Pl. LXII. fig. 8, *a–d.*)

Carapace oval, obscurely pointed behind. Dorsal and ventral margins both well arched, the former most strongly. Anterior extremity broad and well rounded, with a large, acutely pointed beak; the underlying notch large, cuneate. *Ventral profile* oblong-oval, twice as long as broad, the notch forming a transverse, oblong depression at the anterior extremity. End view oval. *Surface* smooth, distantly and slightly pitted. *Colour* light buff, mottled with patches of white and brown.

Length $\frac{1}{10}$ in. (2·54 mm.).

Hab. Japan. Taken in the towing-net (*Mr. A. Adams*).

2. Cypridina elongata, n. sp. (Pl. LXII. fig. 9, *a–d.*)

Valves oblong-oval, twice as long as broad, mucronate behind, flattened in front. Dorsal and ventral margins gently arched. Posterior extremity produced into a flattened, triangular lamina. *Beak* small, sharp, with a rounded, shallow notch. *Dorsal*

aspect oval, fully twice as long as broad, pointed in front, mucronate behind. *Surface* smooth, white.

Length $\frac{1}{14}$ in. (2 mm.).

Hab. Pescadore, China. Taken in the towing-net (*Mr. A. Adams*).

3. Cypridina bairdii, n. sp. (Pl. LXII. fig. 7, *a–m*.)

Carapace horny, suborbicular, convex, about one-third longer than broad, obtusely mucronate posteriorly, flattened in front, Dorsal and ventral margins convex, uniting behind to form a rather broad, obtuse, terminal spine. The anterior margin is sulcate in the middle. *Beak* short and broad; notch rather small. Seen from the ventral surface, the outline of the carapace is oval, oblong; its anterior extremity truncate, posterior subacute. *End view* oval, with broad, truncate extremities. The *right valve* bears on its ventral margin, a little in front of the beak, a rounded prominence, which is absent from the left valve. The left valve is, however, larger and more rounded in outline, so that it overlaps the projections of the opposite valve much in the same way as the large and rounded valve of *Bairdia* overlaps the smaller and angular one. *Surface* ornamented with large and thickly set circular pits, which, on the ventral and dorsal aspects, coalesce so as to form jagged furrows.

Length $\frac{1}{10}$ in. (2·54 mm.).

Hab. Pescadore, China. Many specimens taken in the towing-net (*Mr. A. Adams*).

Genus Heterodesmus, nov. gen.

Carapace subglobose. *Dorsal margin* slightly arched, forming at its extremities two largely developed hinge-processes; the anterior process somewhat waved and scroll-like; the posterior a truncate cone, projecting directly upwards. *Ventral margin* strongly arched. *Animal* unknown.

Heterodesmus adamsii, n. sp. (Pl. LXII. fig. 6, *a–h*.)

Carapace subquadrilateral, convex; length about one-fourth greater than the breadth. Ventral margin prominently arched. Dorsal margin slightly arched, terminating posteriorly in a strong, truncated, conical process, which projects upwards beyond the plane of the dorsum. The anterior *hinge-process* forms a swollen, scroll-like protuberance situated at the upper angle of the anterior margin, and hollowed out beneath so as to form a somewhat flattened beak with a subjacent shallow notch. Posterior margin straight, formed chiefly by the posterior hinge-process. *Dorsal aspect* broadly ovate, once and a half as long as broad, somewhat narrowed in front. *Surface* smooth. *Colour* light buff, mottled with patches of a rather deeper tint. *Animal* unknown.

Length $\frac{1}{15}$ in. (1·9 mm.).

Hab. Japan. Taken in the towing-net (*Mr. A. Adams*).

This curious species is nearly allied to *Entomoconchus scouleri*, M'Coy, but, so far as

I can gather from published descriptions and the examination of fossil specimens, is generically distinct. I much regret that in the attempt to separate the valves of my specimen, for the purpose of examining the animal, one of them was destroyed; so that I am able to describe the hinge-apparatus of the right valve only. The posterior process is hollow (apparently) quite to its extremity; from its anterior basal margin a curved claw-like process projects backwards, and probably articulates with a similar process of the opposite valve. This is represented at Pl. LXII. fig. 6, *d*, *g*, *h*. The anterior hinge consists of a strong projection, analogous to that of *Cythere* and *Cypridina*, and of a concave facet, which appears adapted to receive a protuberance of the opposite valve (fig. 6, *d*).

The species is named after Arthur Adams, Esq., R.N., to whose kindness I am indebted for it and for the *Cypridinæ* described in this paper.

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DESCRIPTION OF THE PLATES.

PLATE LVII.

Fig. 1. *Cytherella pulchra.*
- *a.* Right valve (exterior), × 50.
- *b.* do. (interior), × 50.
- *c.* do. dorsal aspect, × 50.
- *d.* Lucid spots, × 120.

Fig. 2. *Cytherella punctata.*
- *a.* Right valve, outside, × 50.
- *b.* do. dorsal aspect, × 50.

Fig. 3. *Cytherella beyrichi.*
- *a.* Left valve, outside, × 50.
- *b.* do. dorsal aspect, × 50.

Fig. 4. *Cytherella rugosa.*
- *a.* Right valve, outside, × 50.
- *b.* Left valve, dorsal aspect, × 50.

Fig. 5. *Bairdia bosquetiana.*
- *a.* Perfect carapace, right side, × 40.
- *b.* do. ventral aspect, × 40.
- *c.* do. dorsal aspect, × 40.
- *d.* End view, × 40.
- *e.* Lucid spots, × 80.

Fig. 6. *Bairdia amygdaloides.*
- *a.* Right valve, outside, × 40.
- *b.* Left valve, outside, × 40.
- *c.* do. inside, × 40.

Fig. 7. *Bairdia ovata.*
- *a* Left valve, outside, × 40.
- *b.* do. dorsal aspect, × 40.
- *c.* do. inside, × 40.

Fig. 8. *Bairdia subdeltoidea.*
- *a.* Right valve (old), outside, × 40.
- *b.* Left valve, outside, × 40.
- *c.* Perfect carapace, dorsal aspect, × 40.
- *d.* do. ventral aspect, × 40.
- *e.* Left valve, inside, × 40.
- *f.* Right valve, inside, × 40.
- *g.* End view of carapace, × 40.
- *h.* Lucid spots, × 75.

Fig. 9. *Bairdia fusca.*
- *a.* Perfect carapace, right side, × 40.
- *b.* do. dorsal aspect, × 40.
- *c.* do. ventral aspect, × 40.
- *d.* do. end view, × 40.

Fig. 10. *Bairdia crosskeiana.*
- *a.* Perfect carapace, left side, × 40.
- *b.* do. dorsal outline, × 40.
- *c.* do. ventral outline, × 40.
- *d.* do. end view, 40 ×.

Fig. 11. *Jonesia simplex.*
- *a.* Left valve, outside, × 40.
- *b.* Perfect carapace, dorsal view, × 40.
- *c.* Right valve, inside, × 40.
- *d.* End view, × 40.
- *e.* Lucid spots, × 220.

Fig. 12. *Cytherideis maculata.*
- *a.* Left valve, outside, × 40.
- *b.* do. inside, × 40.

Fig. 13. *Cytherideis decora.*
- *a.* Right valve, outside, × 40.
- *b.* do. inside, × 40.
- *c.* do. dorsal outline, × 40.

PLATE LVIII.

Fig. 1. *Cytherideis gracilis.*
- *a.* Perfect carapace, right side, × 40.
- *b.* do. dorsal view, × 40.
- *c.* Right valve, ventral aspect, × 40.
- *d.* End view, × 40.

Fig. 2. *Cytherideis oryza.*
- *a.* Perfect carapace, right side, × 40.
- *b.* do. dorsal view, × 40.

Fig. 3. *Cytherideis pulchra.*
- *a.* Left valve, outside, × 40.
- *b.* do. inside, × 40.
- *c.* do. dorsal outline, × 40.

Fig. 4. *Cytherideis lata.*
- *a.* Right valve, outside, × 40.
- *b.* do. dorsal outline, × 40.

Fig. 5. *Cytherideis tigrina.*
a. Perfect carapace, left side, ×40.
b. do. dorsal aspect, ×40.
c. do. ventral aspect, ×40.
d. do. end view, ×40.

Fig. 6. *Cytheridea margaritea.*
a. Perfect carapace, right side, ×40.
b. do. dorsal aspect, ×40.
c. do. ventral aspect, ×40.
d. do. end view, ×40.

Fig. 7. *Cytheridea curta.*
a. Right valve, outside, ×40.
b. do. dorsal view, ×40.

Fig. 8. *Cytheridea papillosa.*
a. Perfect carapace, left side, ×40.
b. do. dorsal view, ×40.
c. do. ventral view, ×40.
d. Left valve, dorsal view, ×40.
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f. End view of carapace, ×40.
g. Lucid spots, ×210.

Fig. 9. *Cytherideis nobilis.*
a. Left valve, outside, ×40.
b. do. inside, ×40.
c. do. dorsal view, ×40.
d. do. (young), ×40.
e. Shell structure, ×84.

Fig. 10. *Cytheridea minima.*
a. Perfect carapace, right side, ×40.
b. do. dorsal view, ×40.
c. do. ventral view, ×40.
d. do. end view, ×40.

Fig. 11. *Cytheridea müllerí.*
a. Right valve, outside, ×40.
b. do. inside, ×40.
c. do. dorsal view, ×40.
d. do. hinge margin, ×80.

Fig. 12. *Cythere setosa* (Hunde).
a. Perfect carapace (young), ×50.
b. do. ventral view, ×50.
c. do. dorsal view, ×50.

Fig. 13. *Cythere setosa* (var. Hunde).
a. Right valve, outside, ×40.
b. do. inside, ×40.
c. do. dorsal view, ×40.
d. do. hinge margin, ×80.

Fig. 14. *Cytheridea kirkbyi.*
a. Right valve, outside, ×40.
b. do. inside, ×40.
c. do. dorsal outline, ×40.

Fig. 15. *Cythere setosa* (varieties).
a. Left valve (?) (*Hunde*), ×40.
b. Perfect carapace, right side (*Levant*), ×40.
c. do. dorsal aspect, ×40.
d. do. ventral aspect, ×40.
e. do. end view, ×40.

PLATE LIX.

Fig. 1. *Cythere jurinei.*
a. Perfect carapace, left side, ×40.
b. do. dorsal view, ×40.
c. do. ventral view, ×40.
d. Left valve, dorsal outline, ×40.
e. do. ventral outline, ×40.
f. End view of carapace, ×40.

Fig. 2. *Cythere jurinei*, var. *costellata.*
a. Perfect carapace, left side, ×40.
b. do. ventral aspect, ×40.
c. do. dorsal aspect, ×40.
d. End view of carapace, ×40.

Fig. 3. *Cythere hodgii.*
a. Left valve, outside, ×50.
b. do. dorsal outline, ×50.

Fig. 4. *Cythere canaliculata.*
a. Left valve, outside, ×80.
b. do. inside, ×80.
c. do. dorsal view, ×80.
d. Perfect carapace, dorsal view, ×80.
e. do. ventral view, ×80.
f. do. end view, ×80.

Fig. 5. *Cythere oblonga.*
a. Perfect carapace, left side, ×40.

b. Perfect carapace, ventral view, × 40.
c. do. dorsal view, × 40.
d. do. end view, × 40.

Fig. 6. *Cythere mamillata.*
a. Left valve, outside, × 80.
b. do. inside, × 80.
c. do. ventral view, × 80.

Fig. 7. *Cythere producta.*
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal outline, × 40.

Fig. 8. *Cythere venata.*
a. Right valve, outside, × 80.
b. do. inside, × 80.
c. do. dorsal aspect, × 80.

Fig. 9. *Cythere clathrata,* var. *nuda* (young).
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal outline, × 40.

Fig. 10. *Cythere clathrata,* var. *nuda* (older).
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal outline, × 40.

Fig. 11. *Cythere clathrata.*
a. Right valve, outside, × 40.
b. Perfect carapace, ventral view, × 40.
c. do. dorsal view, × 40.
d. do. end view, × 40.

Fig. 12. *Cythere clathrata,* var. *lyrata.*
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal outline, × 40.

Fig. 13. *Cythere clathrata,* var. *latimarginata.*
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal outline, × 40.

Fig. 14. *Cythere mutabilis.*
a. Perfect carapace, young (from Firth of Forth), × 40.
b. Perfect carapace, dorsal view, × 40.
c. do. lateral view, older (Firth of Forth), × 40
d. Perfect carapace, dorsal view, × 40.
e. Right valve (Holy Island, 30–40 fath.), × 40.
f. Perfect carapace, adult (Dogger Bank), × 40.
g. do. dorsal view, × 40.

PLATE LX.

Fig. 1. *Cythere plicatula.*
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal outline, × 40.

Fig. 2. *Cythere catenata.*
a. Left valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal outline, × 40.
d. Surface ornament, × 80.

Fig. 3. *Cythere lactea.*
a. Left valve, outside, × 40.
b. do. ventral view, × 40.
c. do. dorsal view, × 40.

Fig 4. *Cythere septentrionalis.*
a. Perfect carapace, left side, × 40.
b. do. dorsal view, × 40.
c. do. ventral view, × 40.
d. do. dorsal view (valves separated), × 40.
e. Left valve, inside, × 40.
f. Perfect carapace, end view, × 40.

Fig. 5. *Cythere costata.*
a. Perfect carapace, right side, × 40.
b. do. dorsal view, × 40.
c. do. ventral view, × 40.
d. do. end view, × 40.
e. do. dorsal outline (valves separated), × 40.
f. Left valve, inside, × 40.

Fig. 6. *Cythere lactea,* var. *rudis.*
a. Left valve, outside, × 80.
b. do. inside, × 80.
c. do. dorsal view, × 80.

Fig. 7. *Cythere pumila.*
a. Right valve, outside, × 40.
b. Perfect carapace, dorsal aspect, × 40.
c. do. ventral view, × 40.
d. do. end view, × 40.

Fig. 8. *Cythereis batei.*
a. Perfect carapace, left side, × 40.
b. do. dorsal view, × 40.
c. do. ventral view, × 40.
d. do. end view (single valve), × 40.
Fig. 9. *Cythereis subcoronata.*
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal view, × 40.
d. Right valve, ventral view, × 40.
e. do. end view, × 40.
Fig. 10. *Cythereis spinosissima.*
a. Right valve, outside, × 40.
b. do. inside, × 40.
c. do. ventral aspect, × 40.
d. do. dorsal aspect, × 40.
e. do. end view, × 40.

PLATE LXI.

Fig. 1. *Cythereis cristatella.*
a. Perfect carapace, right side, × 40.
b. do. dorsal outline, × 40.
c. do. ventral outline, × 40.
d. do. end view, × 40.
Fig. 2. *Cythere pavonia.*
a. Perfect carapace, left side, × 40.
b. do. dorsal view, × 40.
c. do. ventral view, × 40.
d. do. end view (posterior), × 40.
Fig. 3. *Cythere pumicosa.*
a. Left valve, outside, × 40.
b. do. dorsal outline, × 40.
c. do. ventral outline, × 40.
Fig. 4. *Cythereis lacerata.*
a. Left valve, outside, × 40.
b. do. dorsal aspect, × 40.
c. do. ventral aspect, × 40.
d. do. inside, × 40.
e. Right valve, end view, × 40.
Fig. 5. *Cythere normani.*
a. Right valve, outside, × 40.
b. do. dorsal outline, × 40.
c. do. inside, × 40.
d. Left valve, end view, × 40.
Fig. 6. *Cythere cribriformis.*
a. Right valve, outside, × 50.
b. do. inside, × 50.
c. do. dorsal view, × 50.
d. do. end view, × 50.
Fig. 7. *Cythereis fungoides.*
a. Left valve, outside, × 40.
b. do. inside, × 40.
c. Left valve, dorsal view, × 40.
d. do. end view, × 40.
Fig. 8. *Cythere scabra* (Abrolhos).
a. Left valve, outside, × 40.
b. do. inside, × 40.
c. do. dorsal view, × 40.
d. do. end view, × 40.
Fig. 9. *Cythereis militaris.*
a. Left valve, outside, × 50.
b. do. dorsal outline, × 50.
c. do. ventral outline, × 50.
d. do. end view, × 50.
Fig. 10. *Normania grisea.*
a. Perfect carapace, right side, × 40.
b. do. dorsal aspect, × 40.
c. do. end view (single valve), × 40.
Fig. 11. *Normania glabra.*
a. Perfect carapace, right side, × 40.
b. do. dorsal view, × 40.
c. do. ventral view, × 40.
d. do. end view, × 40.
(The anterior extremity in *a*, *b*, and *c* is placed downwards.)
Fig. 12. *Normania affinis.*
a. Perfect carapace, left side, × 40.
b do. ventral view, × 40.
c. do. dorsal view, × 40.
d. do. end view, × 40.
(The anterior extremity in *a*, *b*, and *c* is placed downwards.)
Fig. 13. *Normania modesta.*
a. Left valve, outside, × 40.
b. do. inside, × 40.

Fig. 14. *Normania dorso-tuberculata.*
a. Perfect carapace, right side, × 40.
b. do. dorsal aspect, × 40.
c. do. ventral aspect, × 40.
d. do. dorsal aspect (variety), × 40.
e. do. end view (posterior), × 40.
f. do. end view (anterior), × 40.
g. Right valve, from behind, × 40.
(The anterior extremity in *a*, *b*, *c*, *d*, is placed downwards.)

Fig. 15. *Normania avellana.*
a. Perfect carapace, right side, × 40.
b. do. ventral aspect, × 40.
c. do. end view, × 40.

PLATE LXII.

Fig. 1. *Cythere parkeri.*
a. a. Perfect carapace, left side, × 40.
b. do. dorsal aspect, × 40.
c. do. ventral aspect, × 40.
d. Right valve, dorsal outline, × 40.
e. End view of carapace, × 40.

Fig. 2. *Cythere areolata.*
a. Perfect carapace, left side, × 40.
b. do. dorsal view, × 40.
c. do. ventral view, 40.
d. do. end view, × 40.

Fig. 3. *Cythere compacta.*
a. Perfect carapace, left side, × 40.
b. do. dorsal aspect, × 40.
c. do. ventral aspect, × 40.
d. do. end view, × 40.

Fig. 4. *Cythere latissima.*
a. Perfect carapace, right side, × 40.
b. do. dorsal aspect, × 40.
c. do. ventral aspect, × 40.
d. Right valve, inside, × 40.
e. End view of carapace, × 40.

Fig. 5. *Cythere rhomboidea.*
a. Left valve, outside, × 80.
b. do. dorsal aspect, × 80.

Fig. 6. *Heterodesmus adamsii.*
a. Perfect carapace, left side, × 16.
b. do. dorsal view, × 16.
c. do. ventral view, × 16.
d. Right valve, dorsal view, × 16.
e. Right valve, front view, × 16.
f. do. back view, × 16.
g. Posterior hinge of right valve, vertical view, × 16.
h. Posterior hinge of right valve, oblique view, × 16.

Fig. 7. *Cypridina bairdii.*
a. Perfect carapace, right side, × 16.
b. do. dorsal view, × 16.
c. do. ventral view, × 16.
d. do. end view, × 16.
e. Contact margin (portion), left valve, × 16.
f. do. right valve, × 16.
g. Abdomen, × 80.
h. Inferior antenna, × 80.
i. First and second maxillæ (?), × 80.
k. Terminal setæ (first maxilla) ?, × 210.
l. Natatory foot, × 60.
m. Superior antenna, × 60.

Fig. 8. *Cypridina japonica.*
a. Perfect carapace, left side, × 16.
b. do. dorsal view, × 16.
c. do. ventral view, × 16.
d. do. end view, × 16.

Fig. 9. *Cypridina elongata.*
a. Perfect carapace, right side, × 16.
b. do. ventral aspect, × 16.
c. do. dorsal aspect, × 16.
d. do. end view, × 16.